

**ABSTRACT OF THE DISCLOSURE****AUTONOMIC AND FULLY RECOVERING  
FILESYSTEM OPERATIONS**

A filesystem operation binds "undo" information to given filesystem resources, in order for the filesystem operation to reverse or rollback changes made to the resources, and thereby return a filesystem affected by a failed or incomplete operation from an inconsistent state to a previous, consistent state. Changes can be undone, to return the filesystem to a consistent state, as long as any further changes can also be undone successfully. Latter changes can be undone by making sure that no operation is fully successful until the preceding operations that changed the same metadata are successful. In an error path, the operation can go through every resource modified to determine if other threads have modified data beyond the initial modification. A failing thread can notify later threads that an operation has failed and all changes are to be undone. Each thread can then run through and undo all pertinent metadata changes that were made.